

RUAG Space Group



- Independent international space equipment supplier
- 1 030 employees in Sweden, Austria and Switzerland
- 8 sites in 3 countries located in
 - Göteborg, Linköping
 - Vienna, Berndorf and
 - Emmen, Nyon, Wallisellen, Zürich

Note:

RUAG Space Sweden is former Saab Space



RUAG Space #1 Products

(in total about 40 million unit operating hours in space over 35 years)

Separation Systems

- 423 in-orbit separations since December, 1981
- Most recent: the morning of October 9, 2009, LCROSS on Atlas V

Ariane Guidance Computers

- 239 computers launched since December 24, 1979
- Most recent: October 1, 2009

Computer System Products

- 275 units launched since TD1 in 1972, with 1.747 equipment years in orbit
- Most recent: October 1, 2009, ComSatBw-1

Frequency Converters/Receivers

- 434 units launched since TV-SAT in 1987
- Most recent: October 1, 2009, compact converters for Amazonas 2

Wide Coverage Antennas (excludes array elements)

- 192 antennas launched since ISEE-B in 1976
- Most recent: October 1, 2009, S-band antennas for ComSatBw-1

Sounding Rocket Guidance and Control

- 221 guidance and control systems flights since January 10, 1976
- Most recent: September 14, 2009, NASROC launch at White Sands in New Mexico



Customers

RUAG

USA

Ball Aerospace
Boeing
International Launch Services
Lockheed Martin
NASA
Northrop Grumman
Orbital Sciences
Sea Launch
Space Systems / Loral
United Launch Alliance

Europe

Arianespace
EADS Astrium
ESA
Khrunichev
Land Launch
OHB
SSTL
Thales Alenia Space
TESAT

Asia

Mitsubishi
NT Space
ISRO

Certificates

RUAG

RUAG Space AB is a certified company to

in 2000:

- **ISO 9001 - Quality Management System Standard**
- **ISO 14001 - Environmental Management Standard**
- **TickIT - Software Management Standard**



and in 2006:

- **AS/EN/JISQ 9100 - Aerospace Quality System Standard**





THEN - in 1999:

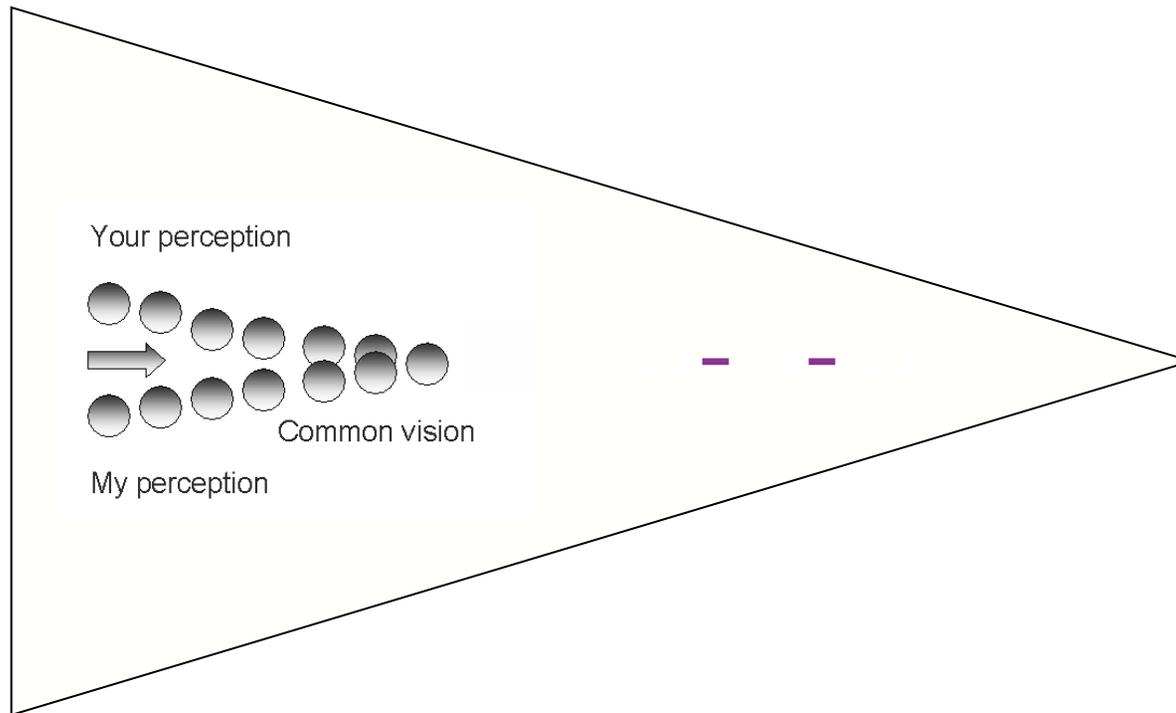
- we were real professionals in our business and we did not always do what we should do - but what we wanted to do
- we had islands in the business where bridges and integration were clearly missed
- we had "kingdoms"
- we needed young engineers with new competences and they did not want to work in "kingdoms"
- people who solved problems late in the projects became "heroes"

THEN - in 1999 cont.:

- we had unclear relations with our suppliers
- we promised sometimes our customers things without doing complete risk analysis
- we "gold plated" our products
- our managers had high workload of the daily operation matters and paid too little attention to planning, communication, strategy and coaching
- too many of our projects did not fulfill planned cost targets and/or promised delivery time

**In 1999 we decided
to go from**

WHAT to HOW!



We set in 1999 the **business targets**:

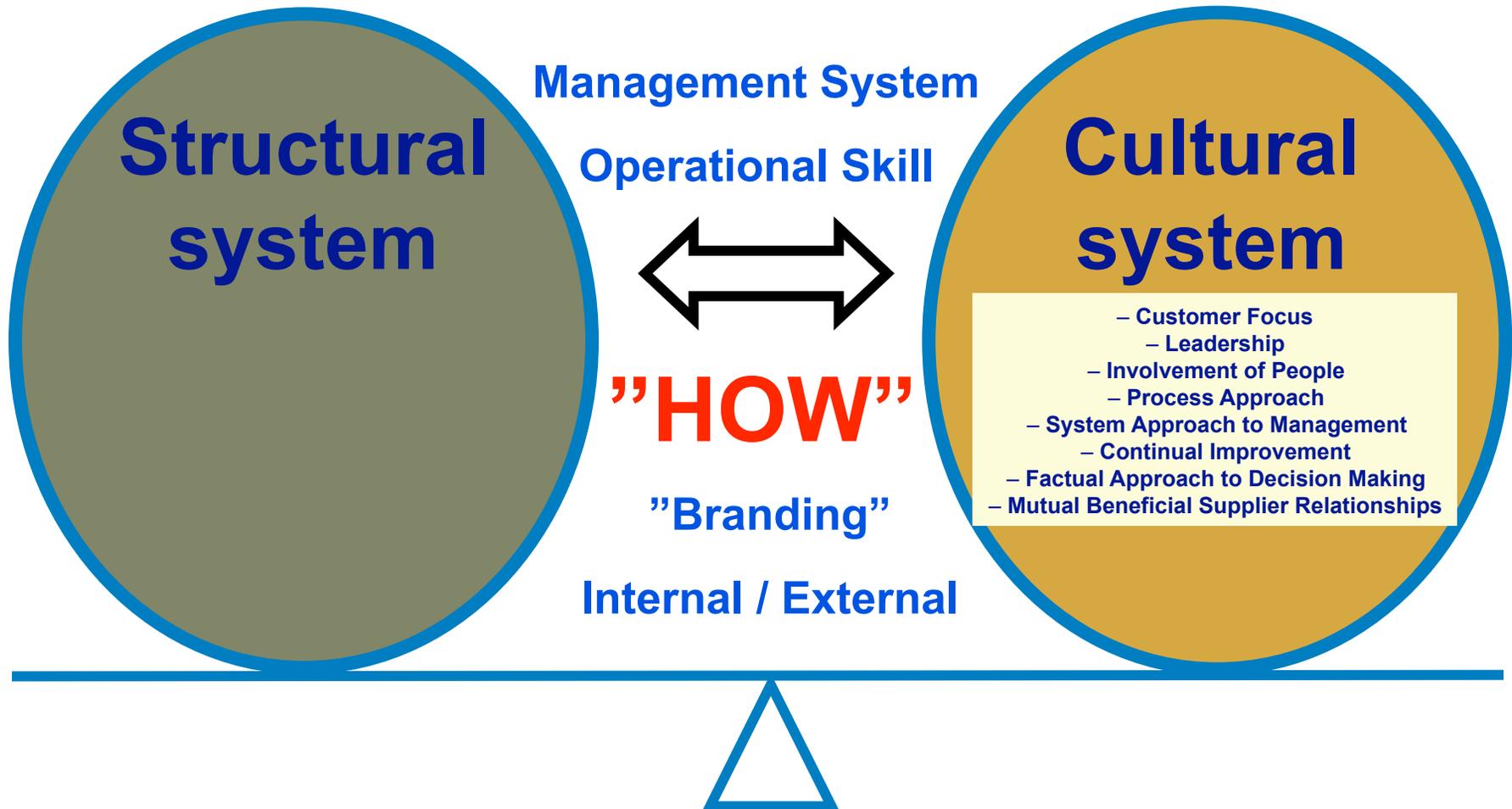
- **30%** lower internal cost!
 - **30%** shorter delivery times to customers!
 - **50%** cut of cost for not correct quality!
- to be achieved in **36** months!

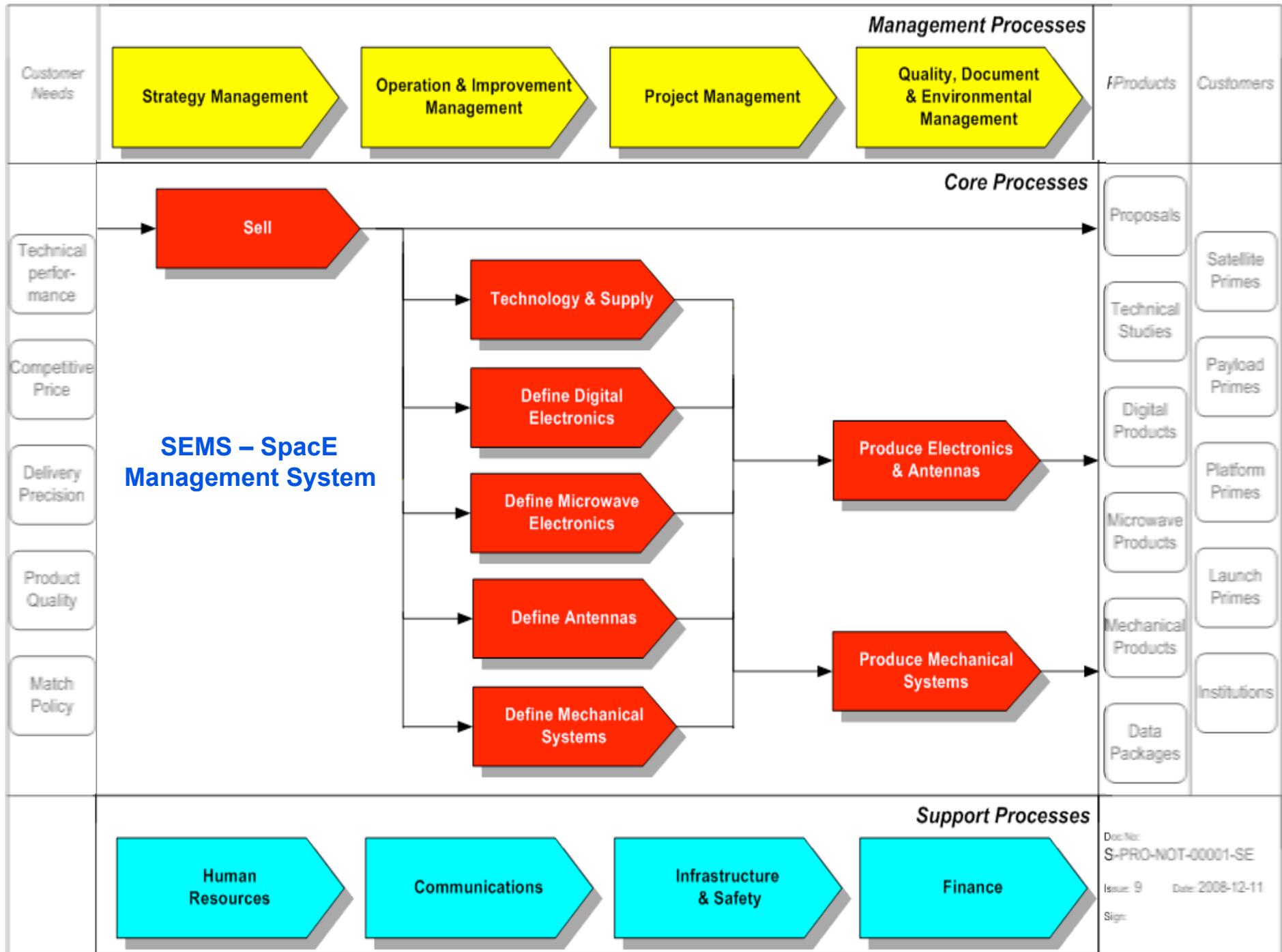
and:

- more fun together starting now!
- the **ISO 9001 certificate** not a target but a **bonus** in **15** months!

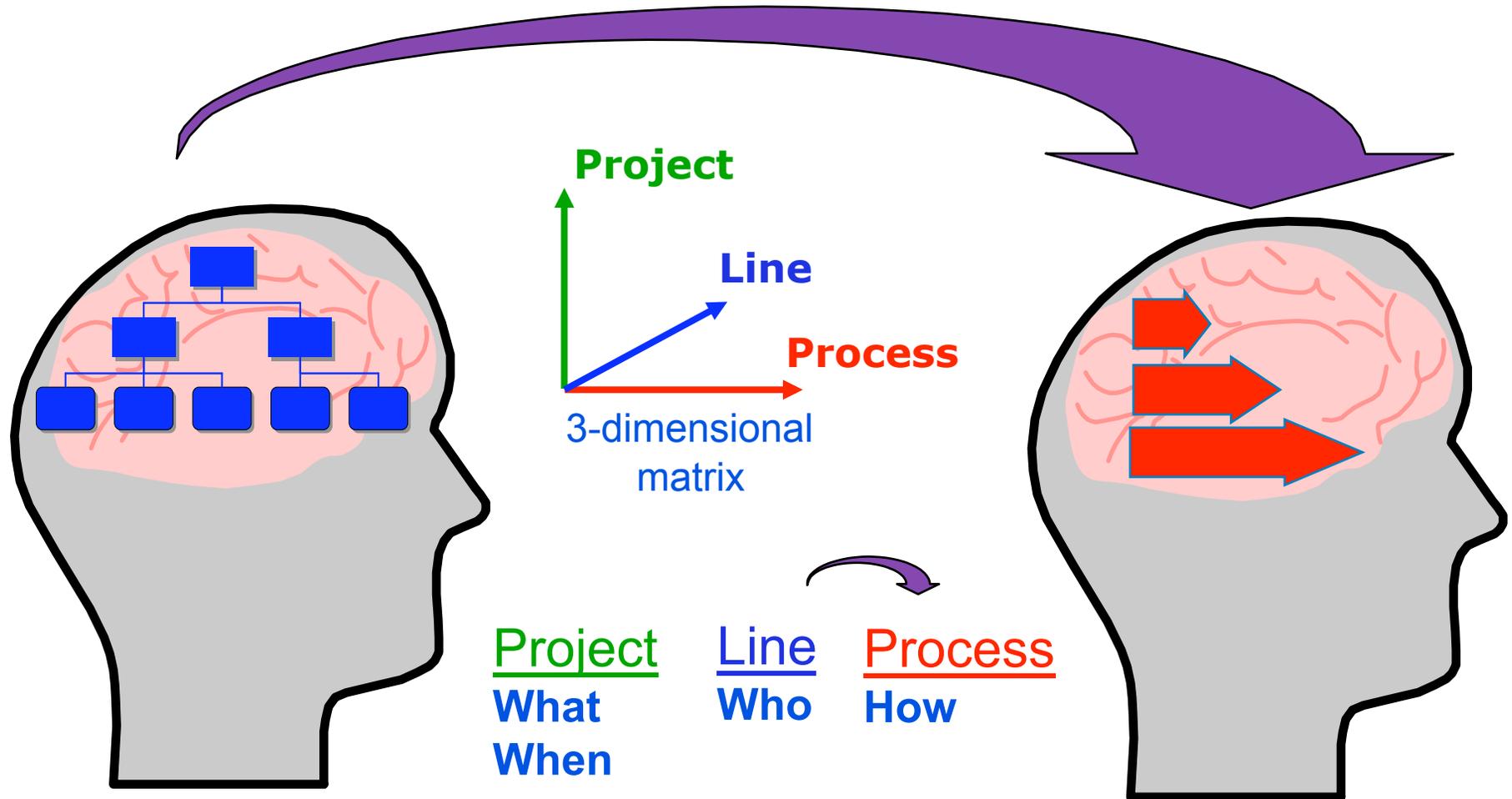


“The Performance Platform”





Change means
- a different way to think and act!

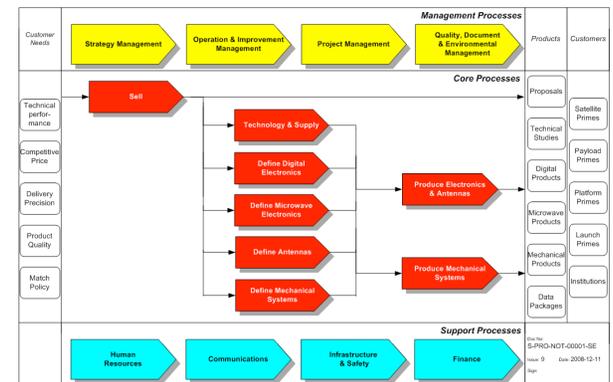


Process Based Management?



Facts about SEMS - our Management System:

- each Process has a Process Manager
- each Process Manager has a Process Team
- in average 5 employees in each team
- in total, 58 process maps on maximum 3 levels
- all routines & procedures are linked to applicable processes
- Intranet solution with direct access for all employees
- we only used Word, Excel, Power-point and Visio to create the system

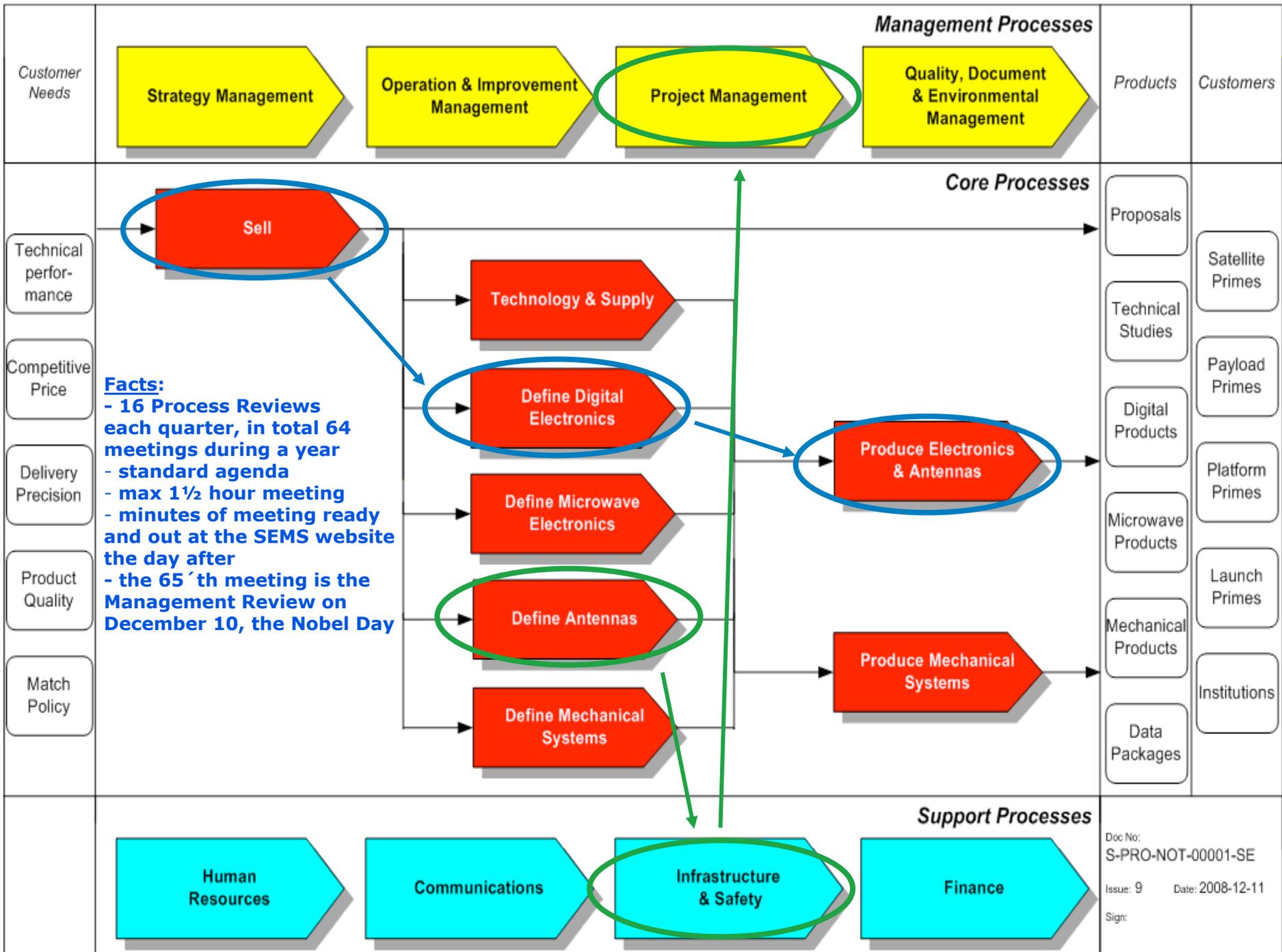


Implementation steps:

- we integrated all ongoing changes into this project
- in our Management team we worked out values and culture based on ISO 9001's eight management principles and the main process map
- after top management's active engagement and homework during 2 out of the 15 months the process of change was deployed at the responsibility of 16 process managers and their teams
- we prepared a **realistic schedule** for the changes to be made during 15 months and 25.000 hours in an organization of about 400 employees
- we started up our **process organisation in April 2000** when we got our ISO 9001 certificate - 4 years later we had integrated the process approach into our minds

To **Sustain and Improve** the Management System and our **Operational Skills** we perform:

- regular internal audits and self audits
- customer audits and assessments
- annual certification audits against ISO 9001, ISO 14001 and AS/EN/JISQ 9100,
- process reviews each quarter in all processes on the main map



NOW – 2009:

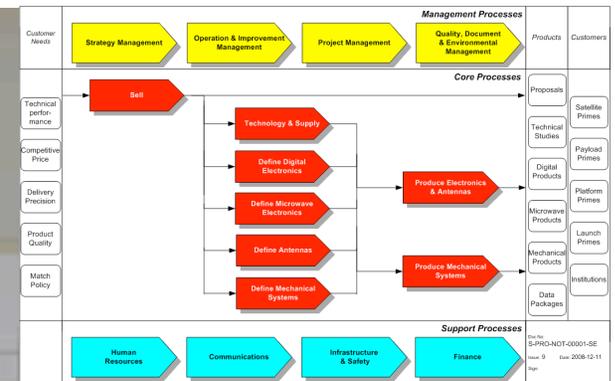
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- today we **create 25% more customer value using 20% less internal resources** compared with 10 years ago
- we have since many years **detailed risk analysis early in the Sell phase and strong supply management** - now **most** of our projects **meet both cost goals and agreed delivery time**
- **higher level of technology re-use and product standardization**
- we have decreased the number of hierarchical levels from **7 to 4** and created **alternative ways of career development** within our process organization
- we **have not made any significant reorganizations of our line structure** during last 10 years - **the evolution takes place within the processes**
- **when downsizing our workforce by 25% in 2002 the hierarchical organization were shaking** - but the processes were stable

NOW – 2009 cont.:

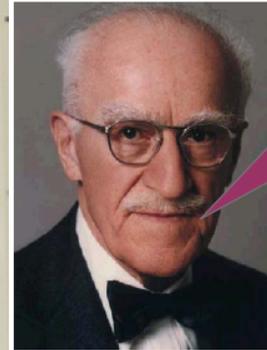
- the process organization is a base for continuous improvements and process development (the "HOW")
- our line managers now have more time for strategic issues, motivation and coaching – in general terms we have a self-correcting operation
- we took away suggestion boxes and connected rewards – continuous improvement is within everyone's daily work based on regular lessons learned and reviews in our processes
- we have created an environment where people gives creativity, take responsibility, feel commitment and proudness in our common mission
- we have kept and increased customer satisfaction during the last years

LEVERANS PRECISION





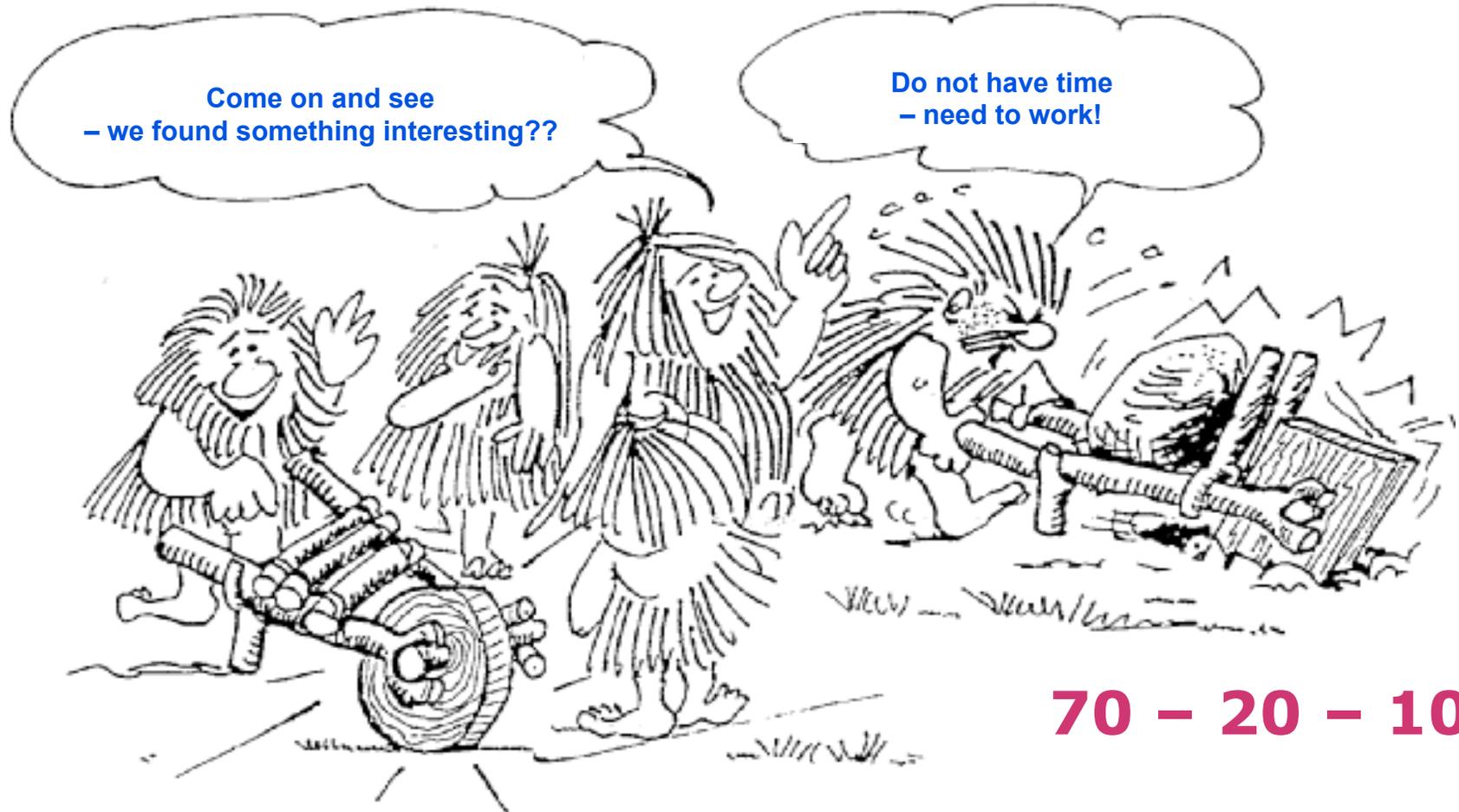
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“All improvement takes place project by project ... and in no other way.”
Dr. Joseph M. Juran

Dr. Joseph M. Juran, 1904 -

Process Based Management?



**Our most important
critical success factors
in the operation and for mission success are:**

**Technology
Mission Experience
and**

”our Processes – the How”!

Success factors

in Implementing & Sustaining a living management system:

- **clear business targets and operational goals**
- **top management team agreed after all long discussions before starting this change in 1999 - WHY TO DO IT!!**
- **our COO was the project leader, - not the quality manager**
- **empowerment and involvement in the whole organization – top down and bottom up and the since start our regular quarterly process reviews**
- **we never changed our schedule, even if we sometimes thought we were short of time – good enough is OK, avoid perfectionism**
- **leadership and top management engagement in the complete process from start over implementation and in sustaining and developing our work**



Sustaining Processes for Mission Success



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Thank You!